

Spiders

of Nandankanan



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Spiders of Nandankanan

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NAVEEN PATNAIK
CHIEF MINISTER, ORISSA



MESSAGE

Nandankanan is one of the major tourist attractions of Orissa. The Zoological Park is one of the finest large zoos in India. Nandankanan enjoys a special place in our state for ex-situ conservation of wild species of flora and fauna. The zoological Park along with the Botanical Garden and Kanja lake has been notified as a Wildlife Sanctuary in 1979 over an area of 4.37 sq. km. Due to its unique biodiversity and display of variety of species in natural environment, Nandankanan attracts more than 2.4 million visitors annually. As a pioneer zoo in our country, it has the glory to be known for captive breeding of white tigers, crocodiles, Indian pangolins and many other species. Nandankanan has been successfully disseminating knowledge on wildlife conservation, awareness, education and research.

Nandankanan provides an ideal habitat for spiders. These interesting creatures play a significant role in controlling insect population. I am delighted to know that Nandankanan is bringing out a publication entitled 'Spiders of Nandankanan' highlighting the species diversity and distribution of spiders. The attempt of documenting the spider diversity in Nandankanan is highly appreciable. The publication shall be of immense use to the researchers, wildlife managers, students and the common visitors for better understanding of the spiders and for their conservation.


(NAVEEN PATNAIK)

Dr. Aurobindo Behera
Principal Secretary
Forest & Environment Dept.



MESSAGE

Nandankanan Zoo is one of the premier zoos in our country and enjoys a special place for its significant achievements in wildlife conservation. It has always been an important place for wildlife research and management. The Zoological Park has the unique distinction of integrating wildlife conservation both in the wild and in captivity. The growing awareness for wildlife conservation has made Nandankanan a popular institution in Orissa which attracted more than 24 lakh visitors during 2010-11.

I am happy to know that a publication entitled 'Spiders of Nandankanan' is being published on the occasion of the 'International Day of Biological Diversity' to be celebrated on 22nd May, 2011. The publication documents the species diversity and distribution of spiders in Nandankanan Sanctuary area. The said publication will be of great help to the scholars, academicians, wildlife managers and visitors to appreciate these interesting creatures and also to create awareness for their conservation.

Aurobindo Behera
(Dr. Aurobindo Behera)



Shri Priyanath Padhi, IFS
Principal CCF (WL) &
Chief Wildlife Warden, Orissa



FOREWORD

Nandankanan Zoological Park, a premier large zoo of India was established on 29th December, 1960. Over past fifty years, Nandankanan has emerged as an excellent centre for wildlife conservation, research and education in the country. The Zoological Park along with the State Botanical Garden and Kanjia Lake - a Wetland of National Importance have been declared as a Wildlife Sanctuary in the year 1979. The integration of *ex-situ* and *in-situ* conservation of many endangered mammals, birds and reptiles at Nandankanan facilitates conservation and restoration of a gene pool of endangered species. Successful captive breeding of endangered Gharial and birth of White tigers from normal coloured parents during 1980 are the milestones in the history of wildlife conservation. The initiatives for conservation breeding of Indian pangolins, White backed vultures and Water monitor lizards are commendable for their scientific inputs.

Many species of free living wild animals including 13 species of mammals, 120 species of birds, 15 species of reptiles, 10 species of amphibians and 92 species of butterflies have been documented in Nandankanan sanctuary area. Nandankanan supports a large variety of spiders which is unknown to the common visitor. A publication on 'Spiders of Nandankanan' is being released on the occasion of celebration of 'International Day for Biological Diversity' on 22nd May, 2011. The attempts of documenting these interesting creatures by Nandankanan management are highly commendable. The publication will generate a lot of interest among common visitors, academicians and researchers for conservation of spiders in their natural habitats. This is the first attempt to document the spider diversity in our State. I congratulate the Director, Nandankanan and his team for their sincere effort in documenting these little known species.

A handwritten signature in black ink, appearing to read "Priyanath Padhi".

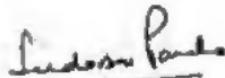
(PRIYANATH PADHI)



PREFACE

Nandankanan Zoological Park, one of the largest premier zoos in our country was established on 29th December, 1960. Nandankanan Wildlife Sanctuary was notified in 1979 over an area of 4.37 Sq.km. which covers the Zoological Park, the Botanical Garden and Kanjia lake. The integration of ex-situ and in-situ conservation of wildlife and wildlife research in Nandankanan occupies a significant place in our Country. The successful captive breeding of white tigers, crocodiles, Indian pangolins and many other wild animals have been carried out in Nandankanan Zoological Park. The Zoological Park has 202 enclosures in which more than 1740 animals belonging to 120 species are displayed in captivity. Nandankanan attracted more than 2.4 million visitors during the last year. Many free living wild animals in Nandankanan Wildlife sanctuary including 13 species of mammals, 120 species of avian fauna, 15 species of reptiles, 10 species of amphibians and 92 species of butterflies have been documented so far.

Nandankanan sanctuary is an excellent habitat for spiders which are not documented. Spiders rank seventh in total species diversity among all other groups of organisms in the world. They play a significant role in ecosystem as a predatory species controlling the insect population. This group of arthropods is very interesting in their morphology as well as in their web weaving behavior. An attempt has been made to document the spider diversity of Nandankanan. The said publication entitled 'Spiders of Nandankanan' documents 51 species of spiders belonging to 37 genera and 17 families which includes both old world and new world spiders.



(Dr. S. Panda)

Director

Nandankanan Biological Park



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INTRODUCTION TO SPIDERS

The spiders are invertebrates. They are well known for their intricately designed webs. The body is divisible into two major parts i.e. cephalothorax (jointed head and thoracic region) and the abdomen. It has an unsegmented cephalothorax with four pairs of legs and a soft unsegmented abdomen with spinnerets. Spiders belong to the class Arachnida of the phylum Arthropoda and constitute the largest order of arachnids. The spider can be easily identified from other arachnids by the presence of the pedicel, a narrow stalk that joins the cephalothorax and the abdomen. All the spiders belong to the order Araneae, one of the eleven orders of the class Arachnida. The smallest recorded spider - Samoan moss spider (*Patu marplesi*) measures only 0.017 inch in size. The largest known spider - Goliath tarantula (*Theraphosa blondi*) has a body length of up to 3.5 inches with leg span of 11 inches.

UNIQUE CHARACTERS

1. They have eight eyes and eight legs.
2. They have a bunch of spinnerets ranging from two to four pairs which help in spinning the web.
3. They use silk to weave their webs make nests on the ground, orbs on the trees, make egg cases to shelter the eggs and wrap their prey before eating.
4. The silk threads are used as draglines to drop down and for ballooning. This silk is re-digestable and is eaten back while repairing and remaking web.
5. All spiders have venom but it is usually weak enough to cause harm to human beings, but the most venomous spiders of the world which can harm human beings are Black widow (*Latrodectus mactans*) and Brown recluse spiders (*Loxosceles reclusa*) (Not found in India).
6. Males are usually smaller than the females; in few species they even get eaten up after mating; hence they are known to show cannibalism.
7. Spiders are close relatives of scorpions with body having two parts; cephalothorax and abdomen.

- Spiders don't eat their food by biting or chewing. They wonderfully pour digestive juices over the body of the prey and suck their whole meal.
- Spiders normally feed on insects, but there are huge spiders called Tarantulas (*Mygalomorphae*) who can prey upon birds, bats, rats, fish and even snakes.
- Spiders lay 2 to 1000 eggs depending upon the species.
- Mothers guard their egg cases invariably in almost all species till the spiderlings hatch out. During this process, they stop feeding.

SPIDER DIVERSITY

Spiders are abundant and widespread in almost all ecosystems and constitute one of the most important components of global biodiversity. They rank seventh in total species diversity among all other groups of organisms. More than 42,055 identified species which belong to 3821 genera and 110 families have been documented so far in the world and there are many species yet to be discovered and described, especially in the tropics. More than 1520 species belonging to 377 genera and 60 families of spiders have been described in India. The study on taxonomy, biology and ecology of the Indian spiders still remains inadequate.

51 species of spiders belonging to 37 genera of 17 families have been recorded from Nandankanan Sanctuary.

HABITAT

Spiders are cosmopolitan and widespread in distribution and are found in all types of habitat and occupy almost all niches. Jumping spiders have been collected from Mt. Everest at 22,000 ft elevation. The spider nest is usually located near the flowers or moist areas for trapping insects. Some web spinners build their nests on the ground to catch walking insects and arthropods. A retreat area may be just off the web in a crevice, rolled leaf or twig. Some species that burrow into soil may situate nests under a log, rock or in a crevice. The jumping spiders do not make webs, but actively hunt for the prey.

DISTRIBUTION

Most spiders live in very specific habitats to avoid undue competition. The spiders select their environment as per their adaptability to different

environmental factors like temperature, humidity, presence of wind, moisture content of the micro-environment, light intensity etc. Some of the biotic factors are also affecting the presence or absence of the spiders like vegetation type and abundant prey base. The amount of space a spider needs to live in is small especially for web building spiders. They can go a long time without food and expend little energy waiting for their prey. Spiders that hunt out their prey obviously use more energy but even these can live for weeks without food. Spiders have very specific micro-habitat within a given habitat as some spiders live near the ground and tree holes near the root, some are bark dwellers, some like to live in close association with the flowers and some in the leaves. Besides, many species live in burrows and under the stones and rocks. Some spiders change their habitat throughout the year as they grow. Spiders are widely distributed on the earth from open areas to buildings and grasslands to tropical rain forests. They can be found in most disturbed areas as well as remote isolated areas. Their diverse range of distribution has made them omnipresent.

ECOLOGICAL IMPORTANCE OF SPIDERS

Spiders have a significant role to play in ecology by being exclusively predatory and thereby maintaining ecological equilibrium. Many spiders feed on noxious insects like houseflies and mosquitos which are vectors of many diseases. Many species feed on termites and control the termite population. A large number of spiders are found in agricultural fields and thus play an important role in controlling the population of many agricultural pests. Besides, medical research using spider venom has yielded several chemicals and drugs that may be useful to control or treat diseases in humans. Spider venom is effective in killing various insects. It has also been found to have components useful in treating cardiac disorders in human beings.

SPIDER BIOLOGY

The body of the spider is divisible into two regions namely cephalothorax and abdomen which are connected together by a narrow stalk called pedicel. The cephalothorax bears the eyes, mouth parts and the legs whereas the abdomen bears the respiratory, reproductive and digestive systems and the silk spinning organ called spinnerets.



The cephalothorax consists of six somites which are welded together and covered above by a dorsal shield or carapace. The ventral surface of the cephalothorax is typically supplied with one or more median plates termed as sterna. Sometimes the sternal plates are united and form a single ventral plate to the cephalothorax.

Spiders have simple eyes and are positioned in the dorsal side of the cephalothorax. In some species, the eyes have been degenerated. Usually the spiders have eight eyes, two being positioned close together in the middle line known as median eyes and three on each side known as lateral eyes. The eyes are set in a cluster (Mygalomorphs) or separated from each other (Araneomorphs).

The mouth of a spider is a minute aperture placed near the lower part of the anterior extremity of cephalothorax. It is bordered by an upper lip called 'labrum' and a lower 'sterna' part called labium. The spiders have four pairs of appendages for the locomotion. The first pair sometimes acts as tactile organ and is not used for progression. Typically the appendages are divisible into seven segments namely coxa, trochanter, femur, patella, tibia, protarsus and tarsus. The tarsus is tipped with two or three claws or rarely one. The abdomen of the spider is generally without appendages. Dorsally they are covered with dorsal plates known as 'terga' and ventrally by 'sterna'.

Spiders are an excellent group to study the evolution of sexual dimorphism. They provide by far the most extreme cases of sexual size dimorphism with females often being massively larger than males. But in some group of spiders like wolf spiders (family-Lycosidae), the males are larger than females. There are number of very interesting sexual dimorphisms in spiders. Some of these are observed only in isolated genera or species, while others are common to all genera and species within the entire spider group. Sexual dimorphism is demonstrated in the morphology of chelicerae (the jaws and fangs) and palpi (the spider's diminutive, anterior and leg-like appendages). Variation in the number and variety of chemoreceptive palpal sensilla are also important characters to differentiate the males from the females. The genital organs of the spiders open to the ventral side of the first or second abdominal somites. The spiders are oviparous (egg-laying) animals. The young ones are born or hatched from the egg resembling their



parents. The growth of the spiders is not accompanied by metamorphosis, but the growth is followed by moulting of exoskeleton.

FOOD AND FEEDING

Spiders are generally predators that eat various other arthropods usually smaller than themselves. Common preys include crickets, flies, bees, grasshoppers, moths and butterflies. Most spiders eat only living or freshly killed food and most of them are not particular about their prey. Many spiders take dead prey and in some species it is very common to be scavengers when the opportunity arises. For example, the Mouse Spider (*Scoplophaeus spp.*) is known to steal dead insects in the wild. Also certain social spiders are known to scavenge the dead bodies of other colony members.

Spiders that choose to sit outside their burrows or hideaways and wait for some suitable organism to wander past like some tarantulas and wandering spiders, rely on vibrations to tell them what is going on. Nearly all spiders use venom to immobilise their prey before feeding. This makes it easy for them to feed on otherwise dangerous animals. Some Crab Spiders will catch Bumble Bees far heavier than themselves. Some spiders such as tarantulas and many of the orb-web spiders use the teeth on the basal segment of the chelicerae to mash their prey while they are feeding. Thomisidae bite only a small hole in the cuticle of their prey and suck the juices out through this. While most spiders feed on invertebrates most of the time, they will take vertebrates when they can.

SPIDER WEBS

Spider webs are made of continuous strands of silk produced from the silk glands present beneath the abdomen of spiders. The silk secreted by the glands not only meant for the weaving of the webs but the spiders use the silk to protect their young, catch food, make homes and move around. Spider silk is an elastic and sometimes adhesive material. The dragline silk of the golden orb weaver *Nephila clavipes* (Nephilidae) is one of the strongest silks with a tensile strength of 1.1 to 1.4 Gpa (Giga Pascal). There is a finger like projections on the ventral side of the abdomen known as silk-spinning organs or 'Spinnerets' which help the spider to construct its web. The webs differ greatly in structure among the different species of spiders. The following are the different principal types of webs:



1. **Orb web:** The principal part of the orb web consists of a series of radiating lines of dry and inelastic silk. The orb webs vary in structure, shape and size according to the families and genera of the spiders. The webs of the family Araneidae, Tetragnathidae and Uloboridae are good examples of orb webs.



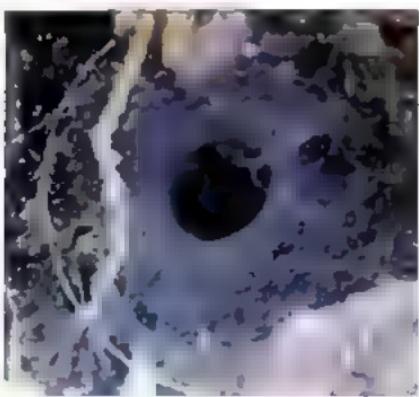
2. **Irregular web:** In this type of web, the mazes of threads extend in all directions irregularly. The members of the family Thelenidae, Pholcidae and a few other spiders spin irregular webs.



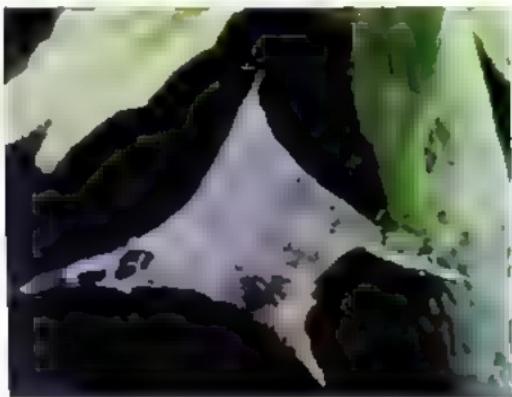
3. **Sheet web:** In this type of web, the principal part of the web consists of a more or less closely woven sheet extended in a single plane and consisting of threads extending in all directions in that plain with no apparent regularity of arrangements. The species belongs to the Genus *Lynyphia* is the most familiar species to build this kind of sheet webs.



4. **Funnel web:** The principal part of the funnel web is sheet like structure but having a tube extending from one edge. Usually a very loose irregular net is spin above the sheet of a funnel web that obstructs the flight of insects and causes them to fall on the sheet where the spider can charge and capture them. The members of the family Agelenidae and Lycosidae are most familiar to construct this kind of web.



5. **Triangular web:** The principal part of the web is of a triangle shape which can be connected to the support by three radiating threads. This type of web is commonly seen in the species of the Genus *Hyptiotes* belongs to the family Uloboridae.



6. **Single line snare:** This is a single horizontal line attached at both ends to the branches that stretches up to four feet across open spaces in the forests. The species belongs to the Genera *Miagrammopes* of the family Uloboridae is a brilliant example for constructing this type of snare.



CLASSIFICATION OF SPIDERS

Spiders belong to the order Araneae in the class Arachnida. Araneae comprises of three suborders namely Mesothelae, Mygalomorphae and Araneomorphae. The suborder Mesothelae is characterized by the segmented abdomen (opisthosoma), two pairs of book lungs and four pair of spinnerets. The Mesothelae contains a single family Liphistidae. Liphistids are tube-dwelling, sit and wait predators that construct rudimentary trap doors. They are nocturnal and live for several years. There are no liphistids have been recorded so far from India. Mygalomorphs are without segmented abdomen and include 15 families. The spinnerets are positioned more posteriorly near tip of the abdomen but lack the anterior median spinnerets. The majority of spiders belong to the order Araneomorphae. Spiders of this suborder are characterized by the labidognath position of the chelicerae and often have only one pair of book lungs. The suborder includes 95 families.

NANDANKANAN SANCTUARY

Nandankanan Zoological Park is one of the finest large zoos of the country and it spreads over an area of 362 ha. Nandankanan houses a number of free living animal species, besides, 120 species of zoo animals. The zoo which was established on 29th December, 1960 has now attracted more than 2.3 million visitors a year. The animal enclosures have been progressively designed to create large enclosures in natural environment. There is a zoo hospital to monitor and provide health care of animals in daily basis. The State Botanical Garden spread over 69 ha adjoining to the zoo has been handed over to Nandankanan management since August, 2006. This is one of the important plant conservation and nature education centre of the State. The cacti house, nurseries, medicinal garden, Japanese garden, landscape garden, rosarium, etc. are being maintained at Botanical Garden. Nandankanan has two important wetlands namely Kanja lake (66 ha.) and Kikani lake. Kanja lake has been included in the list of wetland of national importance by the Ministry of Environment and Forests, Government of India in the year 2006 due to its rich fish and avifauna. The Zoological Park together with Kanja lake and Botanical Garden has been declared as

Nandankanan Wildlife Sanctuary over an area of 4.37 sq. km (notified on 3rd August, 1979).

SPIDER DIVERSITY OF NANDANKANAN

A total of 51 species of spiders have been identified so far inside Nandankanan Wildlife Sanctuary which includes Nandankanan Zoological Park, Botanical Garden and the Kanja Lake. There are also many unidentified species which need further study to complete the spider fauna of Nandankanan. The recorded species of spiders belong to 37 genera and seventeen families which includes Mygalomorphs and Araenomorphs.



FAMILY - THERAPHOSIDAE

1. Common Name: Giant black hairy spider

Scientific Name: *Chilobrachys hardwicki* Pocock 1895



About the species

This spider is commonly found in burrows insulated with silken threads under stones and on clay ground. The cephalothorax is dark brown in colour longer than wide and clothed with brown hairs. The outer face of cheliceras has 3-6 rows of modified setae on its basal corner. The lower line is made up of tapering, medium to long, straight setae, the remaining setae are short. The abdomen is light brown, covered with long hairs. The pro-lateral face of the maxillae has 2-3 lines of horizontal baciform setae. The average body size of the female is 18-20 mm whereas that of male is 12-15 mm long. This species is found both in Zoological Park and Botanical Garden areas.



FAMILY - ARANEIDAE

2. Common Name: Smooth sphere araneid

Scientific Name: *Araneus ellipticus* Tikader and Bal 1981

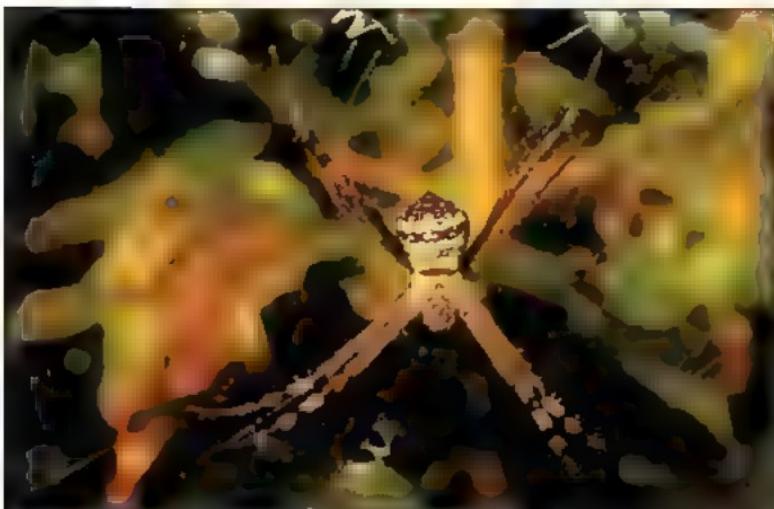


About the species

This species constructs vertical webs in the gardens. This is an endemic species to India. The cephalothorax of the species is narrower in the front and clothed with pubescence and hairs. There is a darker groove in the middle of the thoracic region which is very distinct. The sternum is light greenish in colour and is heart-shaped. Chelicerae are strong and yellowish brown in colour. Legs are light yellowish in colour with spines and hairs. The distal end of the tarsi bears the dark bands. The abdomen of the species is elliptical and roundish. The dorsum is yellowish brown with few blackish spots and four pairs of distinct sigilla arranged mid-longitudinally. The ventrum is deep brown in colour with a median broad darker patch along with chalk white patches between epigastric furrow and spinnerets. The average size of the female is 5-6 mm whereas that of male is 2-4 mm. They have been seen in Botanical Garden.

3. Common Name: Giant cross spider

Scientific Name: *Argiope anasuja* Thorell 1887



About the species

The orbs are seen attached to the branches of plants and the spiders rest in nearby areas. The cephalothorax of the spider is slightly longer than wide and clothed with thick layer of grayish pubescence and hairs. Sternum is heart shaped, pointed behind and provided with a median large chalk white patch with brownish sides. Legs are long and strong and clothed with hairs and spines, femora of all the legs yellowish dorsally; other segments are with indistinct yellow and brown bands. The abdomen is pentagonal and slightly wider than long. Dorsum has chalk-white with transverse brown bands and three pairs of distinct sigilla. The average body size of the female is 8-10 mm whereas that of male is 3-5 mm. This species is widely distributed throughout the sanctuary area including the Zoological Park and Botanical Garden.



4. Common Name: Garden cross spider

Scientific Name: *Argiope pulchella* Thorell 1881



About the species

This species construct orb webs in the gardens. The cephalothorax of the species is slightly longer than wide and clothed with thick layer of silk-white pubescence. Sternum is brown in colour with a large white patch and is heart shaped. Labium is as long as wide and yellowish in colour. Chelicerae are small and brownish in colour. The legs are long and strong and clothed with spines and hairs. The segments of the legs are with alternate brown and yellow patches. The abdomen of the species is pentagonal and clothed with hairs and pubescence. The dorsum of the abdomen is white with deep brown transverse patches and stripes. There are three pairs of conspicuous sigilla present on the dorsum. The ventrum is brownish in colour with a pair of chalk white longitudinal patches. The average size of the female is 8-10 mm whereas that of male is 4-6 mm in length. They are found widely at the sanctuary area.

5. Common Name: Long-bellied cylosa spider
Scientific Name: *Cyclosa bifida* Doleschall 1859



About the species

The spider constructs the vertical webs in gardens. They ornament the web with a band of rubbish made of remains of insects bound in silk and the spider sits within and appears to be a part of the debris. The cephalothorax of the species is brownish black and narrowing in front. The cephalic region is separated from the thoracic region by a cephalic groove and a pit-like thoracic fovea. The sternum is heart shaped and blackish in colour. The maxillae are broad, blackish with distinct scapulae. Chelicerae are blackish brown in colour. The legs are long, clothed with spines and hairs and the femora have a blackish patch at the distal end. The abdomen of the species is elongated with a blunt long caudal process. The dorsum of the abdomen is having one pair of longitudinal silvery patches. Three pairs of distinct sigilla are arranged mid-longitudinally. The ventrum is blackish with a grayish patch. The average size of the female is 8-9 mm whereas that of male is 4-6 mm in length. It has been seen in Botanical Garden.



6. Common Name: Jungle tent web spider

Scientific Name: *Cyrtophora citricola* Forskal 1775



About the species

This species construct a tent web in the bushy vegetation and rests in the centre of the web in an inverted position. The female carries the eggs on the surface of her body. The cephalothorax of the species is brownish in colour with yellowish patch. The sternum is triangular and is pointed behind. The coxae IV is very close and light orangish-yellow in colour. Chelicerae are strong and distinctly swollen at the base. Legs are brownish with yellowish patches and are very strong and stout. The abdomen is strongly overlapping on the cephalothorax and thickly clothed with hairs and pubescence. The dorsum of the abdomen is with a pair of shoulder humps and one pair lateral humps at the middle and one pair of bifid caudal humps. Five pairs of distinct sigilla are arranged mid longitudinally which are grayish yellow laterally. The average size of the female is 10-12 mm and that of male is 6-8 mm in length. They are widely found in the Nandankanan Sanctuary area near the bushy habitats.

7. Common Name: Jungle spiny spider

Scientific Name: *Gasteracantha hasselti* CL Koch 1837



About the species

This spider constructs orb webs between branches of bushes in dry forests and rests in the centre of the web waiting for prey. The cephalothorax of the spider is dark brown slightly longer than wide and clothed with brown and grey hairs. The cephalic region is with a median groove like depression. Sternum is heart shaped and pointed behind which is white in colour with a median rhombic patch. Maxillae are dark brown with pale outer border. Chelicerae are very stout and strong, blackish brown. Legs are short and strong with a dark brown patch except femora I and II. Abdomen of the spider is octagonal, much wider than long, overlapping anteriorly on the cephalothorax and clothed with hairs. It has a yellowish dorsum with few pairs of conspicuous sigilla. Median pair of spines is the largest and much pointed. The average size of the female is 6-8 mm and that of male is 4-6 mm long. This species is found both in Zoological Park and Botanical Garden areas.

8. Common Name: Common garden spider

Scientific Name: *Neoscona mukerjei* Tukader 1980



About the species

This is a common spider hides below green leaves during daytime and is positioned in an inverted position during evening. The cephalothorax of the spider is yellowish, longer than wide and clothed with pubescence and hairs. Thoracic region is with a deep longitudinal groove. Sternum is heart shaped and pointed behind with a median longitudinal white band. Labium is wider than long and dark brown in colour. Chelicerae are strong and yellowish with moderate boss. Distal ends of all the segments except the coxa and trochanter are with dark brown transverse bands. The abdomen is subtriangular tapering posteriorly and clothed with grey pubescence and hairs. There is a club-shaped grayish patch on the dorsum of the abdomen. Five pairs of sigilla arranged mid-longitudinally on the dorsum. This species shows much variation in colour and banding pattern. The average body size of the female is 6-8 mm and that of male is 3-5 mm. They are very common in both Zoological Park and Botanical Garden.

9. Common Name: Grey sphere spider

Scientific Name: *Neoscona nautica* L Koch 1875



About the species

This is a common spider in grasslands associated with water bodies. The spider is nocturnal in nature. The cephalothorax of the spider is longer than wide and darker in colour. The posterior region of the thorax is brownish in colour. Chelicerae is blackish with four teeth in outer margin and three teeth in inner margin. Sternum is blackish with brownish median longitudinal markings. The labium is much shorter blackish, distal margin is whitish. The legs are blackish in colour. The dorsum of the abdomen is velvety black with a mid dorsal slightly paler. A pair of whitish or grayish spots is present on the anterior half present. The average body size of the female is 7-9 mm whereas that of male is 3-5 mm. This species is present in both Nandankanan Zoological Park and Botanical Garden.



10. Common Name: Brown-legged spider

Scientific Name: *Neoscona vigilans* Blackwall 1865



About the species

This species constructs the orb webs in between the twigs of the plants in the gardens. This is one of the endemic species to India. The cephalothorax of the species is pale yellowish brown. The cephalic region is darker than the thoracic region. The fovea is deep reddish in colour and present longitudinally. The sternum is heart-shaped and brownish in colour and broadest at coxa II. The labium is much shorter and brownish in colour. The maxillae are brownish in colour and longer than wide. The proximal part of the tarsi and metatarsi are yellowish in colour and are reddish brown at distal end. The abdomen of the species is reddish brown and gradually tapering to posterior. There is a broad yellowish patch on the anterior half and median darker patch posteriorly having many lateral margins. The average size of the female is 10-12 mm and that of male is 7-9 mm in length. This species is very common in the Zoological Park area of the Sanctuary.

11. Common Name: Abandoned web spider

Scientific Name: *Parawixia dehaani* Doleschall 1859



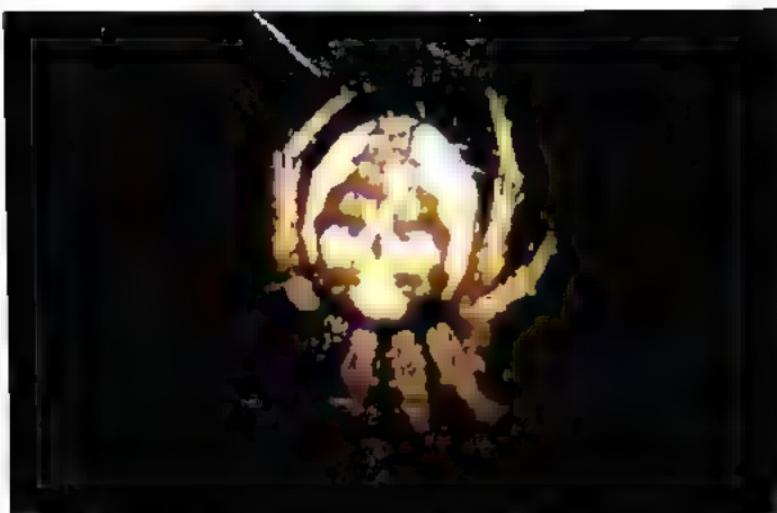
About the species

This is a nocturnal spider and constructs a vertical web with an open hub. The web looks like damaged web and the spider hides underneath a day leaf during the day time. The cephalothorax of the species is reddish-brown and clothed with white pubescence. The cephalic region is much elevated in the middle just behind the ocular area. The sternum is heart shaped and reddish-brown in colour. Labium is dark brown with pale distal margin. It has strong reddish-brown chelicerae with moderate boss. The legs are reddish brown with pubescence, hairs and spines and without any band. The abdomen is dark brown, triangular and two pointed spine like shoulder humps and one pointed tail hump at the posterior end. It has five pairs of sigilla on the dorsum arranged mid longitudinally. The ventrum is grayish brown with indistinct dark brown patches. The average size of the female is 18-20 mm whereas the male is 6-8 mm long. This species is widely found in the sanctuary area.



12. Common Name: Black-headed spider

Scientific Name: *Zygella* sp



About the species

This species constructs the orb web that has many radii. The spiders hides in curled leaf during daytime. The cephalothorax of the species is dark brown, longer than wide with few hairs in the cephalic region than thoracic region. The sternum is heart shaped and clothed with hairs. The labium is slightly wider and is light brownish in colour with pale distal end. The maxillae are broad and moderately strong. The chelicerae are deep brown in colour and are moderately strong. The legs are long and pale in colour. The abdomen is oval longer than wide without any hump bands. The dorsum of the abdomen is with a distinct fulum composed of black and white patches. The average size of the species is 4-6 mm long. It is found in Botanical Garden.

FAMILY - ERESIDAE

13. Common Name: Common social spider

Scientific Name: *Stegodyphus sarasinorum* Karsch 1891



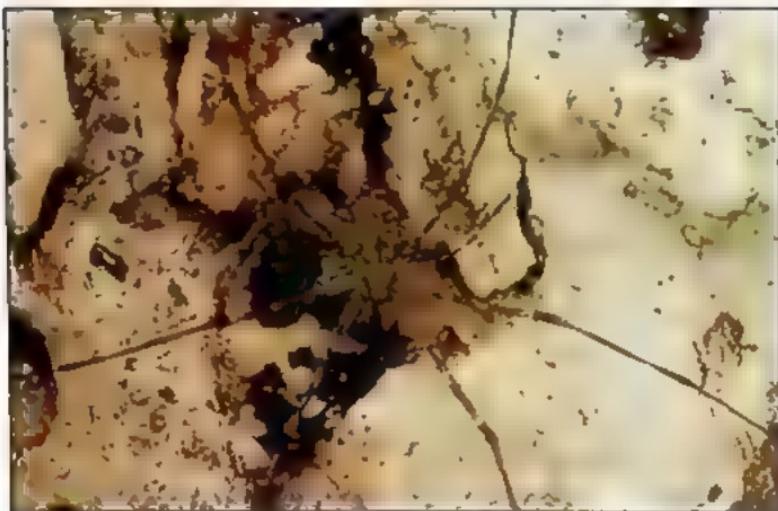
About the species

This species is commonly found in dry and arid areas. They are gregarious species and spin a labyrinthine tube which ends blindly at one end and at other end expands into a broad street. All the members share the same victim when it is alive. The cephalic region is large, rounded, high and grey in colour with black mark on cephalic region. The chelicerae are flat in front with fang groove. The fang groove is scarcely toothed. The sternum is narrow in the front. It has strong legs clothed with spines. The abdomen has the same colour as the cephalothorax and is oval in shape. The cibellum is well developed with an oval cibellar plate. The average size of the female is 10-12 mm and that of male is 6-8 mm in length. It is found in Botanical Garden.

FAMILY - HERSIIDAE

14. Common Name: Two-tailed spider

Scientific Name: *Hersilia savignyi* Lucas 1836



About the species

This spider lives on tree trunks in a head down position. It is a very common spider and exhibits colour variation according to the substrate. The cephalothorax is flat and almost circular with a prominently high clypeus. Legs are very long and slender and are armed with three claws except the third pair. Abdomen of the spider is flat, circular and broader than long. Posterior lateral spinnerets are longer than abdomen. The colour is grayish with a darkish lanceolate cardiac area and dark transverse margins posteriorly. Legs and spinnerets are annulated with dark rings. The average body size of the female is 8-10 mm whereas that of the male is 5-8 mm long. This species is found both in Zoological Park and Botanical Garden areas.

FAMILY - LYCOSIDAE

15. Common Name: Common funnel web spider
Scientific Name: *Hippasa agelenoides* Simon 1884



About the species

This is a common spider in the slopes of sand dunes where they construct funnel webs for capturing prey and wait for the prey at the entrance of the web. The cephalothorax of the spider is light brown, longer than wide and clothed with pubescence. There is a fine lobe in the centre of the thoracic region. The sternum is heart shaped and pointed behind with a mid-longitudinally black band. Chelicerae are brown and the retro-margin of the fang furrow is provided with three teeth. Legs are thin and long with conspicuous greenish brown irregular patches. The average body size of the female is 10-12mm whereas that of male is 6-8mm in length. This species is found both in Zoological Park and Botanical Garden areas.



16. Common Name: Grass funnel web spider

Scientific Name: *Hippasa greenalliae* Blackwall 1867



About the species

This is a common spider in the grasslands where they construct funnel webs for capturing the prey. The cephalothorax of the spider is brown in colour, longer than wide and lateral margins are with spine like hairs. Sternum is heart shaped, light brown and pointed behind provided with hairs and a conspicuous longitudinal median black band. Chelicerae are strong, inner margin with three prominent teeth. The legs are long and strong clothed with spines and hairs. The average body size of the female is 8-10 mm whereas the size of the male is 6-8 mm long. This species is found in Zoological Park areas.



17. Common Name: Soil lycosid spider

Scientific Name: *Lycosa mackenziei* Gravely 1924



About the species

This species construct and live inside the burrows in the loose sand. They are active hunters and the females were seen carrying the cocoon attached to their spinnerets. The cephalothorax of the species is convex, longer than wide and there is a conspicuous fovea in the middle. There are small brown patches in the lateral edges of the cephalothorax and there are brown broad longitudinal bands extending from the base of eyes to the base of cephalothorax. Sternum is heart-shaped and clothed with spine like hairs. The labium is yellowish-brown. The chelicerae are moderately strong with three teeth in the inner margin. The abdomen is longer than wide and nearly oval in shape. The dorsum is ornamented with beautiful pattern of dark brown patches which extend from base to end of the abdomen. There is a conspicuous 'V' shaped marking followed by pale chevrons. The average size of the female is 7-9 mm whereas that of the male is 4-6 mm in length. It is commonly found in Hamra Tang, area of Nandankanan Sanctuary.



18. Common Name: Dark wolf spider

Scientific Name: *Pardosa birmanica* Simon 1884



About the species

It is an active hunter and commonly seen in grasslands. The cephalothorax of the species is dark brown in colour. Center of the thoracic region is light brown with a sharp fovea. The ocular area is black. The sternum is heart shaped and uniformly clothed with dark brown pubescence. The labium is dark brown in colour. The chelicerae are having a furrow with three unequal teeth. All segments of the legs except the tarsi are having conspicuous transverse greenish dark brown patches. The abdomen is oval and clothed with pubescence and hairs. The average size of the female is 6-8 mm whereas that of male is 3-5 mm in length. It is common throughout the sanctuary area.

FAMILY - MITURGIDAE

19. Common Name: Yellow sac spider

Scientific Name: *Chiracanthium danieli* Tikader 1975



About the species

This is a nocturnal spider and is found among foliage at night. During day time, the spiders hide in a sac-like retreat made up of green folded leaves. The cephalothorax is brownish and longer than broad and broadest in the middle. The cephalic region behind the eyes is free of hairs and appears more reddish. Maxillae and labium are reddish brown and darker than sternum. Chelicerae are dark brown and with darker fangs. It has three pairs of proximal dorsal spines in the III and IV metatarsi of the legs. The abdomen is elongated and longer than wide. It has a brownish dorsum and paler ventrum. The spinnerets are yellowish brown and posterior spinnerets are much longer than others. The average size of the female is 9 – 11 mm whereas that of male is 6-8 mm long. This species is found both in Zoological Park and Botanical Garden areas.



FAMILY - NEPHILIDAE

20. Common Name: Black wood spider

Scientific Name: *Nephila kuhli* Doleschall 1859



About the species

This species is commonly found in deep forests and build very large webs on large bushes and trees. The cephalothorax of the species is reddish-brown, longer than wide, slightly narrowing in front than behind clothed with pubescence and hairs. The cephalic region is distinctly elevated as compared to thoracic region but not provided with any tubercles. The sternum is heart shaped and pointed behind. The labium is distinctly elongated than wide. Chelicerae are reddish brown, very strong and stout provided with distinct boss. Legs are very long and strong, clothed with pubescence, hairs and strong spines. The cephalothorax of the male is reddish brown in colour with brown patches. The chelicerae and palp are light brown and black legs. The average size of the female is 30-35 mm whereas that of male is 2-4 mm in length. This species is found both in Nandankanan Zoological Park and Botanical Garden areas.



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21. Common Name: Giant wood spider

Scientific Name: *Nephila pilipes* Fabricius 1793



About the species

This species is commonly found in and around forest areas. These spiders construct gigantic orb webs. Several males can be seen on the periphery of the female's web. The female deposits the egg sac in a pit dug in the ground and covers the pit with plant debris and soil. The cephalothorax of the species is grayish black and longer than wide. Sternum is heartshaped and pointed behind. Labium is longer than wide. The chelicerae are very strong and stout with prominent boss. Legs are very long, clothed with hairs and spines. The cephalothorax of the male is orange brown, longer than broad. The palp is dark brown in colour. Legs are reddish brown with black joints. The abdomen of the female is blackish and clothed with hairs. The dorsum with a pair of mid longitudinal yellowish lines and decorated with yellow patches. Ventrum provide with a broad longitudinal olive brown patch between epigastric furrow and spinnerets. The average size of the female is 35-40 mm whereas that of male is 2-4 mm in length. They are both found in Nandankanan Zoological Park as well as Botanical Garden.



FAMILY - OXYOPIDAE

22. Common Name: Crossed lynx spider

Scientific Name: *Oxyopes birmanicus* Thorell 1887



About the species

This species is commonly found in foliage. They are solitary hunters and do not build webs. During night time they hide under green leaves. The cephalothorax of the species is longer than wide, brownish in colour, cephalic region slightly high with conspicuous fovea marked into darker and light sinuate radiating outwards from the brownish fovea even to the outer border of the mandibles. Labium and chelicerae are deep fawn in colour with darker upper edge. Legs are long and strong, clothed with conspicuous spines, fawn in colour with double deep black lines on undersides of femora, lips of tibiae IV markedly black. The abdomen of the species is longer than wide and clothed with pale brownish hairs. Dorsum is with peculiar pattern. Ventrum is with longitudinal broad brown lines extending from epigastic fold to base of spinnerets and two sides of these brown lines are with a longitudinal patch of chalk-white dots. The average size of the female is 10-12 mm whereas that of male is 6-8 mm. This species is found in Zoological Park as well as Botanical Garden area.

23. Common Name: Striped lynx spider

Scientific Name: *Oxyopes javanus* Thorell 1887



About the species

This species is usually forage on the upper surfaces of the green leaves and bushes. The cephalothorax of the spider is longer than wide, broadest behind the middle. There is a broad 'V' shaped pale mark on the dorsum. The lateral margins are with brownish patches. The fovea is long and located a little behind the middle. The sternum is yellowish brown and heart shaped and clothed with dark prominent hairs. Chelicerae are yellowish brown. The clypeus is yellowish brown with a pair of dark brown lines. There is a blackish line on the ventral side of the legs. The abdomen of the species is longer than wide with a whitish patch in the middle and dark brown lateral sides. The average size of the female is 6-8 mm whereas that of male is 5-7mm long. They are commonly found in Zoological Park and Botanical Garden areas.



24. Common Name: White lynx spider

Scientific Name: Oxyopes shweta Tikader 1970



About the species

This is a common species and can be easily seen on the foliage during the daytime. The cephalothorax of the species is longer than wide and covered with white pubescence. The cephalic region is somewhat circular in outline. Lateral side of the cephalic portion and clypeus are with a narrow black line on either side. Legs are greenish brown and spiny. The abdomen is longer than wide, tapering to posterior end, mid-dorsal area is brownish, bordered on either side by a lateral white longitudinal band. The lateral sides of the abdomen are also with a narrow white line. The average size of the female is 7-9 mm and that of male is 5-7 mm long. They are found both in Zoological Park and Botanical Garden area.

25. Common Name: Lined lynx spider

Scientific Name: *Oxyopes lineatipes* CL Koch 1847



About the species

This is an active hunter and is commonly seen in green leaves of plants. The cephalothorax is longer than wide and reddish-brown in colour. The thoracic region is somewhat circular in outline. There are two longitudinal whitish lines in the middle of the thorax bordered by blackish lines on either side. Lateral side of cephalic portion and clypeus are provided with narrow black lines on either side. Legs are greenish brown and spiny. The abdomen of the species is longer than wide and tapering to posterior end. There are lateral white longitudinal bands on either side of the abdomen. The average size of the female is 7-9 mm and that of male is 5-7 mm long. They are found in Zoological Park as well as Botanical Garden areas.

26. Common Name: Orange lynx spider

Scientific Name: *Oxyopes sunandae* Tikader 1970



About the species

This is a common garden spider and commonly seen in foliages during daytime. The cephalothorax of the species is longer than wide and yellowish brown. Dorsum has two pairs of orange lines. The palpal tibia and the tarsus are with a dorsal black line. The legs are greenish-brown and spiny. The abdomen is longer than wide and tapering to posterior end. The cardiac area is reddish orange bordered by yellowish bands. Anterior portion of yellowish band is with reddish brown patches on lateral side. The average body size of the female is 7-9 mm and that of the male is 4-6mm. It is commonly found in Zoological Park and Botanical Garden.

27. Common Name: Green lynx spider

Scientific Name: *Peucetia viridana* Stoliczka 1869



About the species

This species is commonly found in grasslands. The cephalothorax of the species is longer than wide and clothed with spines. There is a deep lobe in the center of the cephalothorax and green in colour. The clypeus is long and with two black lines extending from the base of anterior middle eyes. The sternum is heart shaped and clothed with spines and hairs. Legs are long and clothed with conspicuous black spots and black long spines. There is a longitudinal deep brown line with lateral branches in the mid-dorsal position of the abdomen. The ventrum has a broad conspicuous longitudinal chalk-white band extending from epigastric fold to the base of the spinnerets. The average size of the female is 10-12 mm and that of male is 8-10 mm in length. It is common in Botanical Garden of the Sanctuary.

FAMILY - PHOLCIDAE

28. Common Name: Box spider

Scientific Name: *Crossopriza lyoni* Blackwall 1857



About the species

This species constructs irregular webs in the corners of the ceiling of the building and lives in close association with human habitation. The cephalothorax of the species is grayish white in colour with a dark band along mid longitudinal line. There is a deep excavation at the top part of the cephalothorax. It has six pearly shaped white eyes located at the tip of the cephalothorax. Legs are long, fragile and have black spots. The joints of the legs are black in colour. The abdomen of the species is grayish off-white with black and white patches. The cardiac area is transparent and triangular in shape when viewed from sides. The spinnerets are located in the lower projection of the triangle. The average body size of the female is 5.6 mm whereas that of male is 3.5 mm in length. It is common in buildings and enclosure corners of the sanctuary area.

FAMILY - PISAURIDAE

29. Common Name: Water spider

Scientific Name: *Thalassius albocinctus* Doleschall 1859



About the species

This species is commonly found in the vegetation attached to the swamps and other water bodies. The cephalothorax of the species is longer than wide. The mid-dorsal area of the cephalothorax is blackish brown with lateral sides bordered by white lateral stripes. There is a bluntly triangular yellowish patch below ocular region. Chelicerae are reddish brown, hairy and provided with boss. The labium and maxillae are similar in colour with chelicerae but lighter. It has a hairy yellowish brown sternum and is longer than broad. Legs are yellowish brown and clothed with hairs and spines. The dorsal surface is black with white lateral longitudinal stripes. In young specimen, the dorsum is provided with seven pairs of small white spots and only four pairs visible in the adult. The abdomen has six pairs of sigilla. The ventrum has a broad triangular dark brown band bordered by yellowish patches on lateral sides. The average body size of the female is 15-20 mm whereas that of male is 10-14 mm in length. It is found in water bodied areas of the sanctuary.

FAMILY - SALTICIDAE

30. Common Name: Heavy-bodied jumper

Scientific Name: *Hyllus semicupreus* Simon 1885



About the species

This is a very active spider and prey on other insects and spiders. These spiders construct oval, thick silken retreat on undersurface of the leaves. The cephalothorax of the spider is dark brown to dull black in colour with dull sand yellow hairs. The height of the clypeus is large and about one third the diameter of the anterior median eyes. The sternum is longer than wide. The abdomen of the male is dark brown to dull black in colour with a covering of golden yellow flat setae. Female has oval abdomen covered with chevrons in white and brown hairs along mid-dorsal line. The average body length of the female and male are 8-9 mm and 7-9 mm respectively. This species is found both in Zoological Park and Botanical Garden areas.

31. Common Name: Small zebra jumper

Scientific Name: *Plexippus petersi* Karsch 1878



About the species

This is a medium sized jumping spider common in and around households, on compound walls and tree trunks. The cephalothorax of the male is 'U' shaped having a broad, black, slightly curved, roughly triangular patch on either side of mid-dorsal line of the cephalic region. Female has a dull light brown or beige coloured cephalothorax. Chelicerae are with one retromarginal and two promarginal teeth. The abdomen of the male is with a broad dark brown or black inwardly curved patch on either side of the mid line. A narrow incomplete line is present along the mid line towards upper end. Two pairs of conspicuous white spots at the middle of the abdomen are very clear. The abdomen of the female is dull light brown or beige in colour with an inconspicuous black, narrow line towards the upper end of the abdomen. Two pairs of faint white spots are present at the middle of the abdomen on dorsal side. The average size of the female is 7-9 mm whereas that of male is 6-7 mm long. This species is found both in Zoological Park and Botanical Garden areas.



32. Common Name: Common zebra jumper

Scientific Name: *Plexippus paykulli* Audouin 1826



About the species

This is a common spider in the walls of the building and the tree trunks. They used to live in the retreats at the corners of the walls, windows and crevices on the walls and tree trunks. The cephalothorax of the species is beige in colour. The males have a 'U' shaped cephalothorax. There is a broad dull white longitudinal band present along the entire length of the body through the mid dorsal line. It is flanked with broad dark brown or dull black areas. The margins of the cephalothorax are dull white. The sternum is oval and narrower in front and is pale yellowish in colour. The abdomen of the species is longer than wide and nearly oval in shape. The abdomen of the male is dull beige and that of female is sand yellow in colour. The females have a mid-dorsal row of chevrons on the abdomen flanked with a conspicuous white spot about the middle. The average size of the female is 7-10 mm and that of male is 7-9 mm in length. It is widely distributed throughout the sanctuary area in the gardens and the buildings.

33. Common Name: Black and white jumper

Scientific Name: *Carholus viduus* CL Koch 1846



About the species

This species is a medium sized jumping spider usually found on bushes and tall grasses. It shows a conspicuous sexual dimorphism. The cephalothorax of the male is jet black in colour with two broad parallel bands formed of white hairs starting from the lower end of the ocular quadrangle and extending up to the tip of the abdomen. Legs are slender and yellowish-brown in colour. The abdomen of the male is jet black whereas that of the female has a dull white or light yellow chevron mark on a dull black background. In older females, the chevron marks may be indistinct. The average body size of the female is 7-9 mm and that of the male is 3-5 mm in length. It is commonly distributed throughout the sanctuary area.



34. Common Name: Metallic jumper

Scientific Name: *Siler semiglaucus* Simon 1901



About the species

This is a small, active spider and dull metallic bluish green with bright orange patches. It is commonly found in bushes, small trees and coconut palms. The cephalothorax of the male is slightly slender and compact having uniform bluish green colour. There are two bands on the lateral margin among which one is white and other is orange. The male and female look alike except a hairy ring on the tibia of the leg-I of the male. The abdomen is spherical and bright bluish green in colour with bright orange patches. The average body size of the species is 4-5 mm in length. It is seen in Nandankanan Park area of the sanctuary.

35. Common Name: Two-striped jumper

Scientific Name: *Telamonia dimidiata* Simon 1899



About the species

This is a comparatively large and active jumping spider having conspicuous sexual dimorphism and is commonly found in leaves of bushes and trees. The cephalothorax of the male is dark brown having a white band along the lateral sides of the head and a white patch in the middle of the ocular quadrangle. Female has a pale cream cephalothorax. It has long legs and clothed with black hairs and spines. The abdomen of the species is longer than wide and pointed behind and clothed with fine short and long hairs. The abdomen of the male is dark brown in colour with a broad, elongated white band present along the mid dorsal line of the abdomen. The abdomen of the female is creamish in general body colour with two light brownish orange lines on the dorsal side of the abdomen. The average body size of the female is 9-11 mm and that of male is 8-9 mm in length. It is commonly found in Botanical Garden of the sanctuary area.



36. Common Name: Common wall jumper

Scientific Name: *Menemerus bivittatus* Dufour 1831



About the species

It is a common spider in buildings and on the tree trunks. The cephalothorax of the species is 'J' shaped. The males have a dull black cephalothorax with a white hairy band along the margins and a broad beige patch immediately behind the cephalothorax. The female has a beige coloured cephalothorax and dull brown bands along the margins. The legs are dark brown with some light brown patches and rings. The upper segments of the male palps have dull white hairs. The abdomen of the male is black in colouration, broad, oval with a blunt anterior end and pointed posterior end. The abdomen has a broad dull brown band along the mid line flanked with broad bands in beige colour; but the females have dull brown bands along the margins. The average body size of the female is 7-8 mm and that of male is 5-6 mm in length. This is a common spider and widely distributed in the sanctuary area.

37. Common Name: Yellow-haired beetle jumper

Scientific Name: *Rhene danieli* Tikader 1973



About the species

It is a medium sized spider resembling beetles in appearance. This species is commonly found on bushes and small trees. The cephalothorax of the species is broad, flat and roughly circular with small inconspicuous eyes. The cephalothorax is black or dark brown in colour clothed with hairs and broad patches on either side of the cephalothorax. There are two oblique parallel lines without hairs are seen in these bright yellow hairy patches. There are also a narrow yellow stripes running along the dorsal margins of the legs. The abdomen of the species is black with a wide band having circular gap in the middle at the anterior end and posterior end. The female is slightly smaller than the male covered with uniformly beige colour hairs. The average size of the female is 4-5 mm where as that of the male is 5-6 mm in length. It is found in Botanical Garden in the sanctuary area.



38. Common Name: Jumping spider

Scientific Name: *Epeus* sp. Peckham and Peckham 1886



About the species

This is a jumping spider with swollen, round, elevated head, slender and pointed abdomen. The colour of the abdomen is usually green. Sexual dimorphism can be seen in some species of this genus in which male is bright coloured with long, stout legs bearing sharp and stiff spines. A downward outgrowth from the outer margin of the cymbium towards the tibial apophysis makes a strong diagnostic feature of the genus. Four species of the genus have been reported so far in India. The species do not live in webs and is generally found beneath the leaf litters on the ground. The species has been recorded from Zoological Park of the Sanctuary area.



39. Common Name: Brown ant-mimic spider

Scientific Name: *Myrmarachne orientalis* Tikader 1973



About the species

This is a medium sized ant-mimicking spider occasionally seen on bushes, small trees and walls. They make thick oval silken retreat under leaves. The cephalothorax is reddish brown and rectangular. The chelicerae in male are as long as cephalothorax having a long slender fang with slightly curved tip. It has long pointed teeth along the ventral margin of the chelicerae. Legs are brown in colour. The female is similar in appearance as that of male but with shorter chelicerae. The abdomen is brown in colour, elongated with a constriction just behind the anterior end. The average size of the female is 8-9 mm whereas that of male is 9-11 mm long. This species is found both in Zoological Park and Botanical Garden areas.



FAMILY - SCYTODIDAE

40. Common Name: Yellow spitting spider

Scientific Name: *Scytodes pallida* Doleschall 1859



About the species

This species is mostly active at night time. It captures its prey by squirting method. It is commonly seen in foliages of gardens and wastelands. The cephalothorax of the species is yellowish with brown patches. The sternum is grayish and oval in shape. Labium and maxillae are similar in colour as the sternum. The legs are light brown with dark brown joints. The abdomen is yellowish with brown transverse patches as cephalothorax and uniformly clothed with small hairs. The ventrum of the abdomen is yellowish in colour. The average body size of the female is 7-9 mm whereas that of male is 4-6 mm in length. It is commonly seen near the building of the sanctuary areas.

41. Common Name: Brown spilling spider

Scientific Name: *Scytodes thoracica* Latreille 1802



About the species

This species lives in close association with human habitation and usually seen in dark places. The cephalothorax of the species is reddish brown with dark patches. There is a median dark line bordered by pale margin on the middle. A broad dark band present about the middle of each lateral half, both bands terminate before posterior margin. There are six eyes arranged in three groups. The sternum is oval and uniformly dark reddish brown in colour. Chelicerae have a short, thick fang and a conspicuous chilinous lamina on the outer margin of the basal segment producing a chelate like appearance. The labium is fused with sternum. The abdomen is creamish white and ovoid in shape. The dorsum has brown markings, higher at anterior half. Spinnerets are small and dark in colour. The average body size of the female is 7-9 mm and that of the male is 4-6 mm in length. It is not commonly seen but encountered near the building of Nandnakanan Park area.

FAMILY - SPARASSIDAE

42. Common Name: Common house spider

Scientific Name: *Heteropoda venatoria* Linnaeus 1767



About the species

This is the most common spider inside houses and occasionally on the tree trunk of gardens. This is a nocturnal spider and a very good cockroach hunter. The cephalothorax of the spider is dorso-ventrally flattened and yellowish brown in colour. The carapace of the male is with a broad black band in the middle region. It has very strong and stout chelicerae and the legs are armoured with spines. The sternum is 'V' shaped. The abdomen of the spider is elongated or oval. The colour of the abdomen is the same as the cephalothorax. The average body size of the female is 25-30 mm and that of male is 20-25 mm. This species is found both in Zoological Park and Botanical Garden areas.



43. Common Name: Green crab spider
Scientific Name. *Olios miliaris* Pocock 1901



About the species

This is a common species in gardens and hides under green leaves during daytime. It is very difficult to find this spider in the field due to the camouflaging green colour among green foliage. The cephalothorax of the species is longer than broad. The dorsum is pale greenish, convex above with inconspicuous fovea. Eyes are reddish in colour. Labium is yellowish-green, longer than broad and scopulate. Maxillae are longer than broad and sternum is heart shaped. Legs are long, spiny, two claws with six teeth on leg I. The abdomen is ovate, longer than broad and greenish in colour. Ventrum is pale yellowish with a broad reddish band in the middle. The average size of the female is 15-18 mm and the male is 10-12 mm long. This species is found both in Nandankanan Zoological Park and Botanical Garden.

FAMILY - TETRAGNATHIDAE

44. Common Name: Dark tetragnathid spider

Scientific Name: *Tetragnatha mandibulata* Walckenaer 1842



About the species

This is a nocturnal spider and commonly seen in grasses and other foliage usually beside a stream or tank. They usually spin large orb webs. The cephalothorax of the species is brown to yellowish brown in colour except the black eye margins. It has a deep and distinct fovea. The sternum is brownish yellow extended laterally between the coxa. The chelicerae have 14 promarginal and 16 retromarginal teeth. Legs are long and yellowish brown in colour. It has a yellowish brown abdomen. The abdomen is terminating in a rounded tip slightly extending beyond spinnerets. It is readily distinguishable from other tetragnathid spiders by the forwardly directed first ventral tooth of the female. The average body size of the female is 11-13 mm whereas that of male is 7-9 mm in length. It is commonly seen in the Botanical Garden of the sanctuary area.

45. Common Name: Cochin tetragnathid spider

Scientific Name: *Tetragnatha cochinensis* Gravely 1921



About the species

This species is common in grasslands and build orb webs and hide on the under surface of a contiguous leaf or grass blades during the day time. The cephalothorax of the species is brownish yellow in colour. The chelicerae are slender and have small teeth and first of each row is situated at the base of the fang with the second far behind. The abdomen is twice longer than the cephalothorax and lighter in colour. The posterior end protrudes beyond spinnerets in the upper part and pale ventrum. The average size of the female is 9-11 mm and that of male is 5-7 mm in length. This species is widely distributed throughout the sanctuary area.



FAMILY - THERIDIIDAE

46. Common Name: Rolled-leaf spider

Scientific Name: *Achaearanea mundula* L Koch 1872



About the Species

This species constructs irregular webs in low vegetation and hide in a leaf retreat. The cephalothorax of the species is reddish brown with a median dark brown longitudinal patch in the cephalic region. The sternum is heart shaped and reddish brown in colour. The eyes are pearly white in colour. The legs are yellowish brown and clothed with hairs. The abdomen is balloon shaped and clothed with hairs. The dorsum has eight whitish patches arranged in two transverse rows. The ventrum is yellowish brown with a median broad blackish patch in the middle. There is a small white lateral spot in between the black spot and the spinnerets. The spinnerets are reddish brown and have a reddish hook like mark on each side of epigynal furrow. The average body size of the female is 4-6 mm and that of the male is 2-4 mm in length. It is commonly found in Botanical Garden of the sanctuary.

FAMILY - THOMISIDAE

47. Common Name: Brown flower spider

Scientific Name: *Camaricus formosus* Thorell 1887



About the species

They are commonly found in flowers and leaves ambush their prey. The cephalothorax of the spider is red with dark brown abdomen and light greenish legs. The cephalothorax is highly clothed with black hairs and with conspicuous deep brown or black patches in the lateral side. Sternum is heart shaped and pointed behind. Legs are robust and ornamented with black patches. In males, leg I and II pair are completely dark brown in colour. The abdomen is longer than wide clothed with black hairs. Longitudinally and laterally decoration of chalky white bands are being noticed in the abdomen. The average size of the female is 7-9 mm whereas the average size of the male is 4-6 mm long. This species is found in Botanical Garden areas.



48. Common Name: Red flower spider

Scientific Name: *Camaricus khandalaensis* Tikader 1980



About the species

They are commonly found in flowers and hide themselves underneath the petals and ambush prey. The cephalothorax of the species is light brown in colour and clothed with some spiny hairs. The sternum is heart shaped and light green in colour. The maxillae are brown, wider at the distal end and clothed with hairs. The labium is dark brown. The abdomen is longer than wide and broadest just behind the middle and decorated with mid-dorsally and dorsolaterally with chalk white conspicuous patches. Some pale spots are also present antero-dorsally. There is a longitudinal brown patch extending from the epigastric furrow upto the base of the spinnerets. The average size of the female is 7-9 mm and that of the male is 4-6 mm in length. This species is found in flower gardens of the Botanical Garden.

49. Common Name: Crab spider

Scientific Name: *Thomisus pugilis* Stoliczka 1869



About the species

This is a common spider in the flower gardens. This species is endemic to India. The cephalothorax is broader than long produced forward into two lateral conical processes which is pale brown in colour. Clypeus is very high and there is a pair of white streaks extending up to the top of the cephalic prominence. The sternum is broadly oval. The anterior metatarsi is provided with five pairs of ventral spines. The posterior legs are without spines. The abdomen is subquadrate and a pair of conical shoulder tubercles are present, each with a black spot situated inwardly in the middle. The colour of the abdomen is white or yellowish white with transverse grooves in the posterior half of the abdomen. The average body size of the female is 7-9 mm whereas that of male is 4-6 mm in length. This species is commonly found in the flower gardens of the Botanical Garden.



50. Common Name: Crab spider

Scientific Name: *Thomisus sikkimensis* Tikader 1962



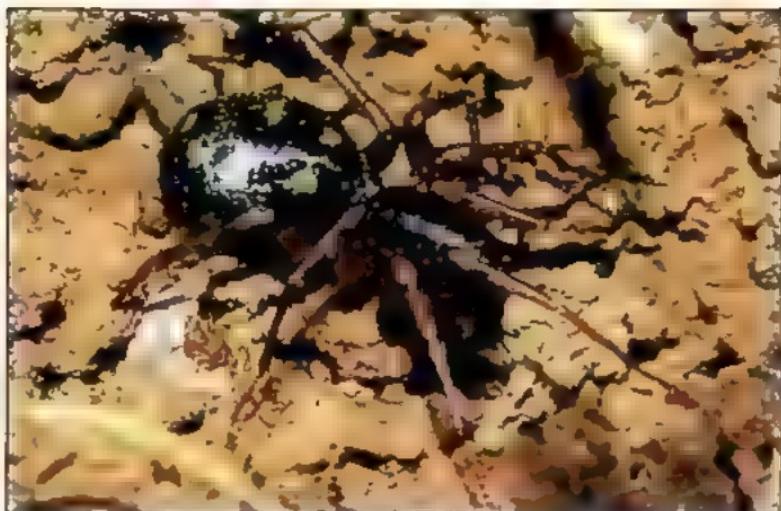
About the species

This is a common species in flower gardens. This species is endemic to India. The cephalothorax of the species is broadest posteriorly and slightly narrowing at front. The antero-lateral sides have conspicuous longitudinal black bars. The clypeus is long and subrectangular. The legs are long and stout. The first and second legs have conspicuous black spots on trochanter, femur, patella and tibia. The III and IV legs are unspotted and without any hairs or spines. The abdomen of the species is pentagonal and slightly overlaps with the cephalothorax in the front. There is a blackish incomplete transverse line on the broadest region of the abdomen. The average body size of the female is 7-9 mm whereas that of male is 4-6 mm in length. This species is common in the flower gardens of the Botanical Garden.

FAMILY - ZODARIIDAE

51. Common Name: Burrowing spider

Scientific Name: *Hermippus sp.*



About the species

This species is commonly found on the forest floor. Two species have been reported from India so far. The cephalothorax of the species is shiny black, smooth with smoothly curved posterior margin. The sternum is black and somewhat oval. Legs are yellowish-orange in colour. There are four dorsal spines on the femur I and II. Abdomen is narrower towards the anterior and broadest in the posterior half. The dorsum is blackish in colour with three large yellowish patches. The lateral sides also bear many yellowish markings on the black background. This is occasionally recorded from the Botanical Garden of the sanctuary.



GLOSSARY

abdomen: that part of the spider's body posterior to cephalothorax.

apex: the distal tip of uppermost part

appendage: a structure that is attached to and projects from the main body of an animal, in spiders, these are the palps, mouthparts, legs and spinnerets

arachnida: a principal division or class of the air breathing arthropods including the scorpions, mites, spiders, harvestmen, etc.

arachnologist: one who studies arachnids

ballooning: the process whereby young spiders are dispersed by being suspended and carried through the air on a mass of silken threads or a single thread

basal: in the direction or toward the base

carapace: the hard plate forming the dorsal surface of the cephalothorax representing the fused tergites of the prosoma

cardiac area: a dorsal area on the abdomen overlying the heart frequently distinctively marked

carnivorous, feeding on other animals

cephalothorax: also called as prosoma, anterior part of body covered by the carapace

chelate: those chelicerae in which the fang closes down on a tooth-like process

chelicera: (pl. chelicerae) the first pair of jaw like appendages in the head of spiders and other arachnids

chevron: a figure, pattern or object having the shape of a 'v' or an inverted 'v'

clypeus: that region of the head between the anterior edge of the carapace and the anterior eyes in spiders

coxa: the first segment of the leg

diurnal: active during the daytime

dorsum, dorsal side of the abdomen

endemic: occurring naturally only within a particular area

epigastric: pertaining to the ventral side of the abdomen

epigynum: a chitinous or sclerotised plate on the ventral side of female abdomen in which the genital openings are located

fang: the claw like distal portion of the chelicerae which articulate with the paturon through which poisonis injected into the prey

fovea: a depression on the thoracic region of the carapace where muscles are attached

kleptoparasite: animals that steal or feed on prey captured by other animals

labium: the median sclerite on the ventral surface of the cephalothorax between the maxillae and anterior to the sternum

maxilla: the modified coxae of the palps that are used as a pair of crushing plates

nocturnal: active at night

palp: second appendage of cephalothorax situated posteriorly to the chelicerae and anteriorly to the first pair of legs

pedicel: a stalk or stem connecting the cephalothorax to the abdomen

promarginal teeth: the teeth present on the dorsal or anterior side of the cheliceral furrow

stigmata: circular impression on sternum in some mygalomorphs and dorsum of some Araneomorphae corresponding with lateral muscle attachments.

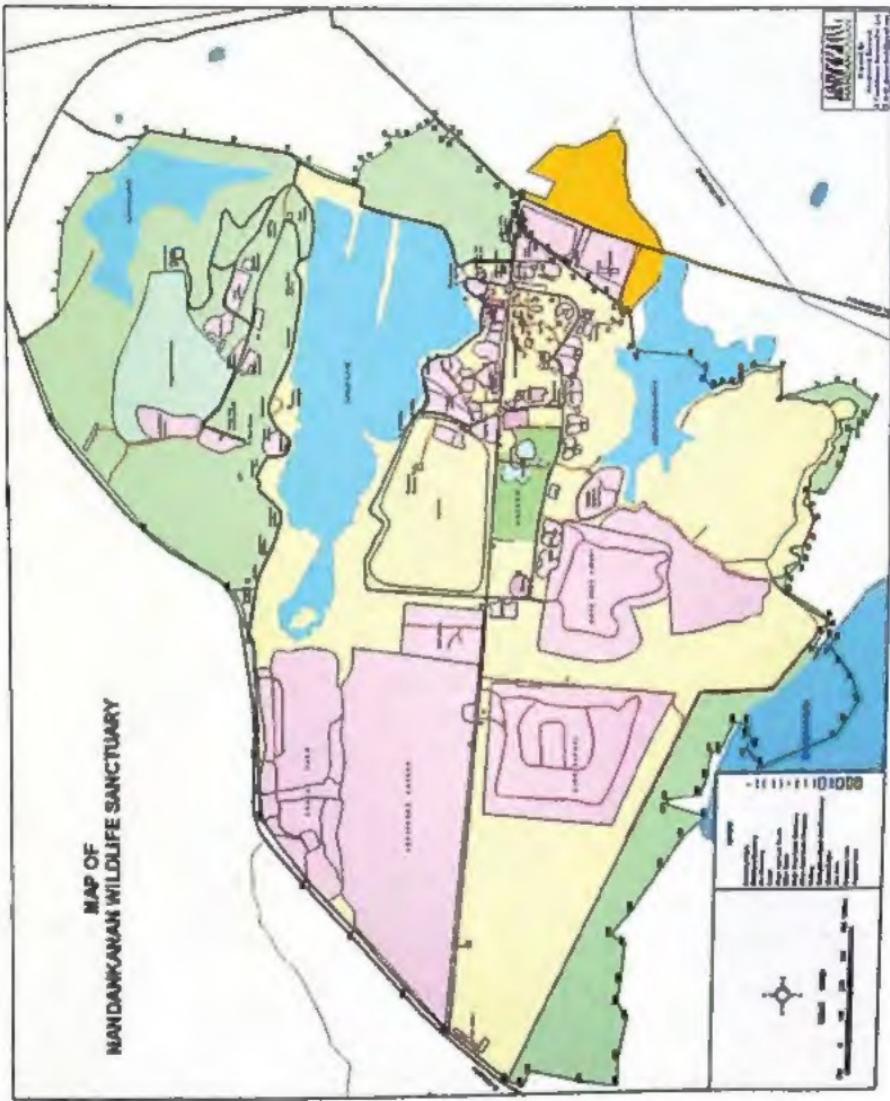
tergum: upper or dorsal surface



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MAP OF MANDELAHAN WILDLIFE SANCTUARY



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